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STATISTICAL BULLETIN
Metropolitan Life Insurance Co.

VOL. XI MAY, 1930 No. 5

DEATHRATES BY SEASON OF THE YEAR

The chart on page 2 presents graphically, over a period of fifteen years, the mortality among Metropolitan Industrial policyholders (ages one year and over) at the four seasons of the year.

The outstanding items shown by the chart are:

1. Since the great influenza pandemic of 1918, the mortality rate at every season has been markedly lower than before the pandemic.

2. Since 1920 (when a recrudescence of the influenza epidemic occurred), there has been no decided trend of the deathrate, upward or downward, at any season of the year.

3. Uniformly, the summer season has enjoyed the lowest deathrate.

4. The winter season registered the highest deathrate in every year, with the exception of 1918, when the huge autumn death toll of influenza raised the mortality to an unprecedented figure either for autumn or for any other season of the year.

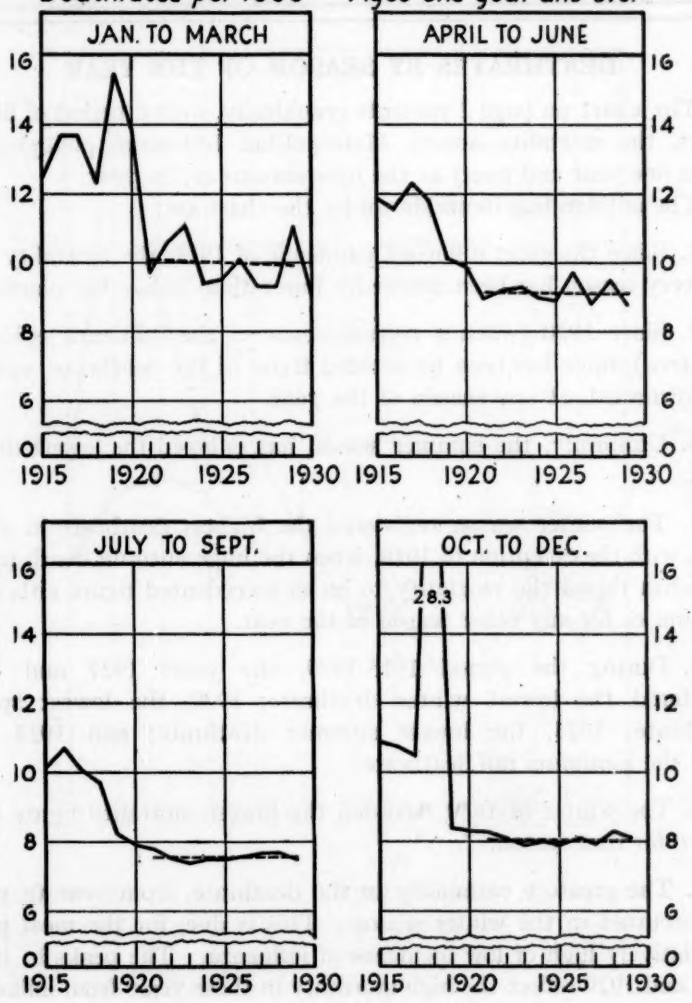
5. During the period 1915-1929, the years 1927 and 1928 registered the lowest winter deathrate; 1929, the lowest spring deathrate; 1923, the lowest summer deathrate; and 1923 and 1925 the minimum fall deathrate.

6. The winter of 1930 recorded the lowest mortality figure ever shown for that season.

7. The greatest variability in the deathrate, from year to year, has occurred in the winter season. This is due, for the most part, to relatively high or low incidence of influenza. The peaks in 1923, 1926 and 1929 reflect the high mortality in those years from influenza and influenzal pneumonia. The summer season shows the least change in the deathrate, from year to year.

MORTALITY FROM ALL CAUSES
EACH QUARTER OF YEARS 1915 TO 1929
Metropolitan Life Insurance Company ~ Industrial Dept

Deathrates per 1000 ~ Ages one year and over



NOTE : Broken lines indicate the trends in years 1921 to 1929.

AIRPLANE FATALITIES

While deaths from airplane accidents have never attained much numerical importance in the United States, the latest data concerning these fatalities suggest that the time may not be far off when they will become a significant cause of death. At any rate, they numbered 473 in the Death Registration Area in 1928, as compared with only 214 in 1927; and the deathrate increased from 0.2 per hundred thousand in 1927, to 0.4 in 1928. In the State of California alone, the number of deaths increased from 27 in 1927 to 96 in 1928, and the deathrate from 0.6 to 2.1.

Nevertheless, the mortality rate for these accidents remained practically stationary for nine years. The Government statistical records for them date back only to 1919, in which year 156 deaths were reported to the UNITED STATES BUREAU OF THE CENSUS, with a deathrate of 0.2 per hundred thousand. This identical deathrate prevailed for six of the nine years from 1919 to 1927. Then, in 1928, came the sharp rise to which we have referred.

The story of the mortality in airplane accidents is very different from that for automobile fatalities. Deaths from this latter cause began to attract the attention of vital statistics bureaus in 1906, when 183 fatalities occurred in the United States Registration Area, corresponding to a deathrate of 0.4 per hundred thousand. Immediately, however, a sharp rise was observed. The mortality rate doubled in two years and tripled in three; and in 10 years it reached 5.9 per hundred thousand—substantially 15 times as high as in the first year for which records were kept. Obviously this rapid rise in the automobile deathrate was due, in large part, to the rapidly increasing number of cars in use. The increase in airplanes, of course, has been a much slower process. Nevertheless, the sudden doubling of the deathrate in 1928 suggests that, with more and more planes manufactured and used, the airplane deathrate may be about to take a decided upward course.

More deaths from this type of accident occur in California than in any other State. In 1928, for example, 96 of the 473 fatalities in the United States Registration Area were charged to California, and the airplane deathrate in that State was 2.1 per hundred thousand, or more than five times as high as that for the area as a whole. In every year of the period from 1919 to 1928, without exception, the airplane deathrate was higher in California than in any other State. A recent report of the UNITED STATES DEPARTMENT OF COMMERCE, nevertheless, accounts for the high mortality in California.

This report shows that more than one-sixth of the licensed airplane pilots of the Country reside in that State. The actual number is given as 2,244, against 1,153 in New York; 671 in Illinois and 640 in Texas. During the 10-year period, 1919-1928, there were 1,896 airplane deaths in the United States Registration Area. Of these, 332 occurred in California; 132 in Ohio; 106 in New York; and 105 in Illinois.

Complete data on airplane fatalities for 1929 are not available at this writing. The NATIONAL SAFETY COUNCIL has stated the number of deaths in that year, from "civil aviation accidents" alone as 485. When 91 fatalities in the Army, Navy and Marine Corps Air Services are added to this number, some increase, at least, will be shown over the previous maximum, as recorded for 1928.

Deaths and Deathrates per 100,000 Population from Aviation Accidents in the United States Registration Area and in Selected States, 1919 to 1928

Year	Reg. Area		Calif.		New York		Illinois		Mass.		N. J.		Missouri		Ohio	
	Dths.	Rate	Dths.	Rates	Dths.	Rates	Dths.	Rates	Dths.	Rates	Dths.	Rates	Dths.	Rate	Dths.	Rates
1919	156	.2	19	.6	15	.1	5	.1	4	.1	6	.2	6	.2	8	.1
1920	150	.2	38	1.1	10	.1	4	.1	5	.1	9	.3	4	.1	7	.1
1921	132	.1	26	.7	7	.1	4	.1	4	.1	5	.2	2	.1	3	.1
1922	159	.2	16	.4	8	.1	10	.1	1	*	1	*	2	.1	7	.1
1923	145	.1	33	.8	6	.1	9	.1	2	*	5	.1	3	.1	13	.2
1924	142	.1	30	.7	5	*	11	.2	–	–	1	*	2	.1	19	.3
1925	165	.2	22	.5	10	.1	6	.1	3	.1	4	.1	4	.1	29	.4
1926	160	.2	25	.6	9	.1	18	.2	2	*	1	*	4	.1	3	*
1927	214	.2	27	.6	12	.1	14	.2	1	*	19	.5	5	.1	10	.1
1928	473	.4	96	2.1	24	.2	24	.3	10	.2	18	.5	8	.2	33	.5

*Deathrate less than .05 per 100,000.

INFANTS ORPHANED FROM BIRTH

Orphanhood is a misfortune at any age for a minor child; but each year a number of babies meet with this misfortune at the very beginning of their career, and this may happen either by the mother dying from one of the causes associated with the puerperal state; or, in some cases, the father dies even before the child is born. It is interesting to have some information regarding the frequency with which these events occur.

It might be supposed at first sight that the information regarding the number of infants orphaned by death of their mother from puerperal causes would be fairly easy to extract from statistical data. But when we attack the problem we are confronted with a

number of difficulties. Mortality reports tell us the total number of deaths from puerperal causes each year, but not all of these deaths are accompanied by the birth of a living child. The puerperal deathrate is particularly high at stillbirths, in fact, it is nearly twenty-four times as high among these as among live births.* Now the number of puerperal deaths in the United States, is about six per thousand live births, and there are about 3.6 stillbirths per one hundred live births. Making due allowance for this, computation shows that there must be about 3.4 puerperal deaths among the mothers of a thousand live-born children in the United States population, white and colored combined. The rate among the white alone is a trifle less—about 3.3 per thousand. According to this, about 3,300 white children per million, or 3,400 of all children per million; lose their mothers at birth. As a matter of fact, this estimate still errs on the side of excess, for there are a considerable number of deaths from puerperal causes among women who do not reach the stage of parturition, or who have an abortion not counted as a stillbirth. Unfortunately, it seems impossible to separate these cases from the statistics of total deaths from puerperal causes. We can, therefore, frame our estimate only in these terms, that the proportion of white children that lose their mother at birth is somewhat less than 3.3 per thousand.

The further question may be raised, how many persons in the living population are "puerperal orphans," that is, have lost their mother at birth? If such children died according to the same mortality as other people, the answer would be that 3.3 per thousand represents also an upper limit for the average number of persons who lost their mother at birth, per thousand of the general population. In actual fact, they probably suffer a mortality somewhat above average, and thus the figure of 3.3 per thousand, as applied to the living population, is in still greater degree an overestimate. But accepting the figure with this minor reservation, in the population of the United States at the present time, which we assume to be about 121,500,000, there must be about 400,000 persons who lost their mothers at birth. Among these about 370,000 are white persons.

Posthumous children, that is, children born after their fathers' death, are commonly thought of as rarities; but in reality their number is large. Just how often must these cases occur? We can form an approximate estimate as follows: The average age of the

*_Maternal Mortality_, United States Department of Labor, Children's Bureau Publication No. 158 (1926) p. 26.

fathers in the reproductive period is about thirty-three years. At that age their deathrate is about 4.6 per thousand per annum. Now each man that becomes a father is exposed during the nine months of the mother's pregnancy to the routine risks of life. With an annual deathrate of 4.6, this means 3.5 deaths per thousand fathers during that period. Thus about one child in two hundred and eighty is born a posthumous orphan. This estimate is subject to one modification. Men who become fathers of children are a somewhat select group. They must be relatively free from certain chronic diseases. Their deaths will be caused for the most part by accidents, acute disease, or other relatively sudden causes. Their general health is, therefore, a little above the average at that age; for this average includes all chronically sick individuals. We should, therefore, apply to these fathers a deathrate somewhat below the general average, and the figure of one child in two hundred and eighty for the proportion of children born posthumously errs, therefore, on the side of excess.

As for the proportion of posthumous orphans in the general population, here again there is no doubt a somewhat excessive deathrate among such children, so that the proportion in adult life will fall below the proportion at birth. But if we disregard this correction, we find that, in the population of the United States, there must be another 400,000 persons born as posthumous children.

SMALLPOX IN THE UNITED STATES AND CANADA, 1929

Reports from 44 States, the District of Columbia and eight Canadian Provinces show that more cases of smallpox were registered in 1929 than in either 1928 or 1927. For both countries combined, there were fewer deaths, nevertheless, and, therefore, a lower case-fatality rate. In Canada alone, there was much less smallpox than in either 1928 or 1927, and the case-fatality rate was low.

In the United States, Illinois reported more cases than any other State, but Louisiana, Maine, Georgia and Texas had notably high case-fatality rates. The country was fortunate, as in a number of prior years, in experiencing its higher case-fatality rates in areas where there were relatively few cases of smallpox. The only exception to this among the States in 1929 was Texas.

Seldom does a year elapse without affording one or more examples of what happens when smallpox of the more malignant type attacks

a community. In outbreaks in Washington, D. C. and Camden, N. J., in 1925, the case-fatality rates were 33.9 per cent. and 39.8 per cent., respectively; in 1926 there were 232 deaths in California out of 2,794 cases; and in Arizona there were 6 deaths among 18 persons attacked. In 1927, a number of cities recorded high case-fatality rates, although, fortunately, the cases themselves were small in number. In Wyandotte, Michigan, for example, only three smallpox cases were reported in 1927; but all died. In 1929, El Paso, Texas, was the most outstanding example of what happens when virulent smallpox attacks a community. Here there were 11 deaths among 59 cases, corresponding to a case-fatality rate of 18.64 per cent. If this ratio of deaths to cases had prevailed among the 38,062 persons who had smallpox in 45 American States last year, about 7,100 deaths would have resulted. The same case-fatality rate among 4,251 cases in Illinois would have caused the deaths of nearly 800 persons instead of the 17 which were actually charged to this loathsome disease in that State. In 1922, the case-fatality rate in 43 American States was 2.8 per cent. Had that rate prevailed in 1929, there would have occurred 1,066 deaths in 44 States and the District of Columbia, instead of the 132 that were actually recorded.

The danger of a widespread outbreak of virulent smallpox is ever present, because the number of susceptible persons is large. Until this number is greatly reduced by general acceptance of vaccination, there will be no real security against smallpox.

Smallpox Cases, Deaths and Case-Fatality Rates. Years 1927-1929 for Forty-four States, District of Columbia, and Eight Canadian Provinces

Area	1929			1928			1927		
	Cases	Deaths	Deaths per 100 Cases	Cases	Deaths	Deaths per 100 Cases	Cases	Deaths	Deaths per 100 Cases
United States and Canada...	40,046	137	0.34	39,103	145	0.37	36,873	160	0.43
United States (44 States and District of Columbia).....	38,062	132	0.35	35,673	141	0.40	34,042	150	0.44
Canada (8 Provinces).....	1,984	5	0.25	3,430	4	0.12	2,831	10	0.35

Selected States and Canadian Provinces Showing a High Case-Fatality Rate or Above-Average Prevalence of Smallpox During the Year 1929

Area	Cases	Deaths	Deaths per 100 Cases
United States			
California	2,469	10	.41
Georgia	165	2	1.21
Idaho	1,063	2	.19
Illinois	4,251	17	.40
Indiana	3,468	14	.40
Iowa	1,913	5	.26
Kansas	1,950	2	.10
Kentucky	1,430	8	.56
Louisiana	177	3	1.69
Maine	72	1	1.39
Michigan	2,410	9	.37
Missouri	1,449	6	.41
Ohio	3,223	3	.09
Oklahoma	2,033	8	.39
Oregon	1,187	3	.25
South Dakota	1,578	2	.13
Texas	2,457	26	1.06
Canada			
British Columbia	451	2	.44
Ontario	708	0	0
Quebec	232	1	.43
Saskatchewan	382	2	.52

Smallpox Cases, Deaths and Case-Fatality Rates for the Years 1927-1929. For 607 United States Cities and 82 Canadian Cities

Area	1929			1928			1927		
	Cases	Deaths	Deaths per 100 Cases	Cases	Deaths	Deaths per 100 Cases	Cases	Deaths	Deaths per 100 Cases
United States and Canadian Cities (689)	11,790	29	.25	10,718	23	.21	10,145	31	.30
United States cities (607)	10,966	28	.26	9,502	22	.23	8,943	30	.34
Canadian cities (82)	824	1	.12	1,216	1	.08	1,202	1	.08

Smallpox Cases and Deaths in Certain Cities, 1929

City	Cases	Deaths	Deaths per 100 Cases
Canada			
Vancouver, B. C.	300	1	.33
Regina, Sask.	149	0	0
United States			
Atlanta, Ga.	13	1	7.69
Chicago, Ill.	73	1	1.37
Jacksonville, Ill.	209	0	0
Peoria, Ill.	180	1	.56
Rock Island, Ill.	148	1	.68
Fort Wayne, Ind.	313	0	0
Hammond, Ind.	75	1	1.33
Muncie, Ind.	399	0	0
Vincennes, Ind.	51	1	1.96
El Dorado, Kan.	183	1	.55
Boston, Mass.	7	1	14.29
Flint, Mich.	520	1	.19
Highland Park, Mich.	28	1	3.57
Springfield, Mo.	238	1	.42
Omaha, Neb.	65	1	1.54
Akron, Ohio	381	0	0
Portland, Ore.	572	1	.17
Sioux Falls, S. D.	421	0	0
Dallas, Texas	238	0	0
El Paso, Texas	59	11	18.64
Fort Worth, Tex.	361	1	.28
Seattle, Wash.	70	2	2.86
Tacoma, Wash.	379	1	.26

HEALTH RECORD FOR APRIL, 1930

In April, as in the three preceding months of 1930, the deathrate among the nineteen million Industrial policyholders of the Metropolitan Life Insurance Company showed improvement over last year. In only two years, 1927 and 1922, has the April deathrate been lower than in 1930. The cumulative deathrate for the four months period, January to April, was much lower than in the like part of 1929, and somewhat below the figure for the corresponding period of 1928.

Among policyholders living west of the Rocky Mountains, the deathrate was 7.4 per thousand in April, 1930, against 7.7 for the same month in 1929; in the rest of the United States, the 1930 figure was 9.9 per thousand as compared with 10.1 in April, 1929. Among the Canadian policyholders, the mortality rate for this month in 1930 (9.8 per thousand) was somewhat higher than for last year (9.4). In Canada, nevertheless, as well as in all sections of the United States

the cumulative deathrate for the four months period, January-April, was lower than that for the like part of 1929.

While the greatest single factor in this year's more favorable health record has been the decline in the influenza-pneumonia deathrate, the most significant items in the table on page 11 are the cumulative deathrates of 85.2 per hundred thousand for tuberculosis (all forms) and 74.0 for tuberculosis of the respiratory system. These figures mark a drop since last year in the mortality rate for all forms of tuberculosis of 9.7 per cent. and for respiratory tuberculosis of 12.2 per cent. But these declines are even more significant when it is considered that they have occurred in the very part of the year when the mortality from tuberculosis runs highest. So great has been the gain this year that the tuberculosis deathrate for the season of highest mortality is at substantially the same figure as recorded for the *whole* year 1929. It is easy to see that when the lower deathrates of the summer and fall enter into the computation, the tuberculosis mortality rate for 1930 is destined to fall to a point far below that recorded for any preceding year.

Another outstandingly favorable health development of 1930 is the drop of more than 20 per cent. in the mortality from diphtheria. The cumulative deathrate for this disease at the end of April, 1930, was far below that for the corresponding period of any preceding year. Improvement is also in evidence for typhoid fever, measles, whooping cough, diabetes, heart disease, respiratory conditions other than pneumonia, diarrheal complaints, chronic nephritis, cancer, puerperal conditions and accidents. The drop in the cancer deathrate is very slight and may be entirely wiped out by figures for later months.

With the exception of the increase in automobile fatalities, no cause of death had shown, up to the end of April, any noteworthy increase over the deathrate for the like period of 1929. The deathrate from motor vehicle accidents, however, seems destined to go on registering new high points each year.

The general deathrate for the large cities of the United States during April was 14.1 per thousand as against 14.0 for March and 13.3 for April, 1929. There were more cases of measles and smallpox reported than in March, but there was less diphtheria, influenza, poliomyelitis, scarlet fever and typhoid fever. Comparison with April, 1929, shows greater prevalence of influenza, measles and smallpox, but lower incidence of diphtheria, poliomyelitis, scarlet fever and typhoid fever. Measles cases, which increased decidedly in March, showed another sharp rise in April. This applies especially to Vermont, New York, Michigan, Arkansas, Colorado, Wyoming and Oklahoma. The rise

in smallpox cases in April was slight. In Iowa, nevertheless, 446 cases were reported, as compared with 323 in March. The corresponding numbers for Nebraska were 335 and 179; and for Kansas, 477 and 312.

The following table shows the mortality among Industrial policyholders for April, 1930; March, 1930, and April, 1929, together with the cumulative deathrate for the first four months of each year.

METROPOLITAN LIFE INSURANCE COMPANY

Deathrates* per 100,000 for Principal Causes, Premium-Paying Business in Industrial Department (Annual Basis)

MONTHS OF APRIL, 1930; MARCH, 1930, AND OF APRIL, 1929

CAUSES OF DEATH	RATE PER 100,000 LIVES EXPOSED*				
	Apr. 1930	Mar. 1930	Apr. 1929	Cumulative Jan.-Apr. 1930	Cumulative Jan.-Apr. 1929
TOTAL—ALL CAUSES	975.2	940.6	994.4	955.7	1113.7
Typhoid fever	1.0	1.1	1.5	1.1	1.5
Measles	6.5	3.6	5.4	4.0	4.2
Scarlet fever	4.1	3.3	4.1	3.8	3.6
Whooping cough	4.4	4.2	5.7	4.7	6.9
Diphtheria	6.2	6.8	9.2	8.2	10.3
Influenza	19.8	25.3	33.1	25.5	99.8
Tuberculosis (All forms)	90.4	86.1	95.5	85.2	94.4
Tuberculosis of resp'y system	77.4	75.4	85.9	74.0	84.3
Cancer	78.5	74.2	76.0	75.7	76.3
Diabetes mellitus	19.6	19.6	19.4	20.5	22.7
Cerebral hemorrhage	65.4	62.9	60.5†	63.6	64.0†
Organic diseases of heart	164.2	159.5	161.7	163.4	175.1
Pneumonia (All forms)	118.7	119.0	111.2	115.3	151.2
Other respiratory diseases	13.5	14.0	13.3	13.2	16.0
Diarrhea and enteritis	11.8	11.1	12.1	11.5	13.3
Bright's disease (Chronic nephritis)	76.4	70.7	74.5	72.1	78.1
Puerperal state	10.8	13.1	14.0	12.9	14.7
Suicides	10.3	9.8	9.7	9.2	8.7
Homicides	5.7	7.5	6.5	6.6	6.4
Other external causes (excluding suicides and homicides)	52.4	48.7	57.9	55.7	56.8
Traumatism by automobiles	17.9	13.9	17.2	17.3	15.6
All other causes	215.5	200.1	222.9	203.4	209.7

*All figures in this table include infants insured under one year of age and are subject to slight correction, as they are based on provisional estimates of lives exposed to risk.

†Rate not comparable with that for 1930.

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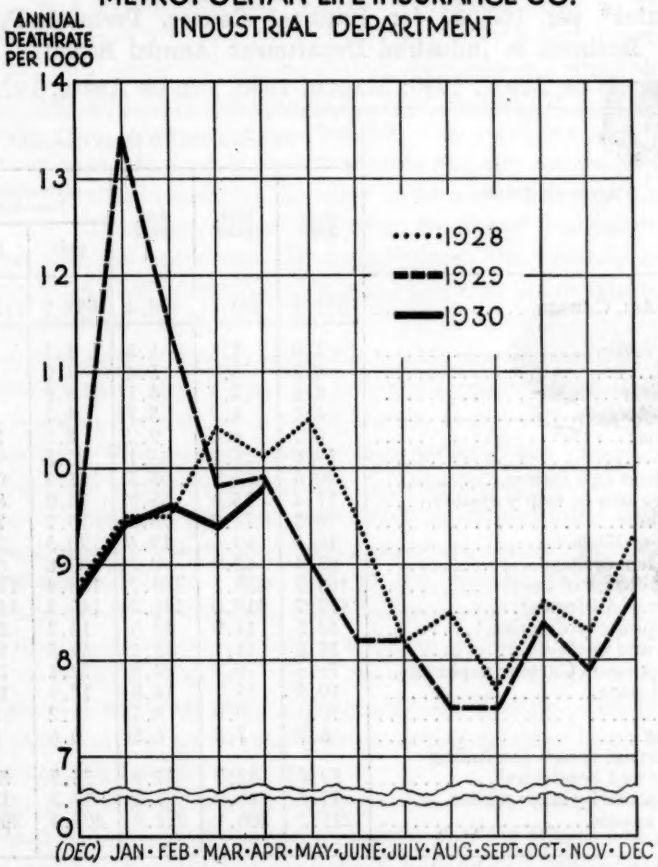
DEATHRATES
FROM ALL CAUSES

METROPOLITAN LIFE INSURANCE CO.
INDUSTRIAL DEPARTMENT



1928*	9.5	9.5	10.4	10.1	10.5	9.5	8.2	8.5	7.7	8.6	8.3	9.3
1929	13.4	11.4	9.8	9.9	9.0	8.2	8.2	7.5	7.5	8.4	7.9	8.7
1930	9.4	9.6	9.4	9.8								

* Rates for 1928 are final.

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